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1971 OPERATING
SUMMARY

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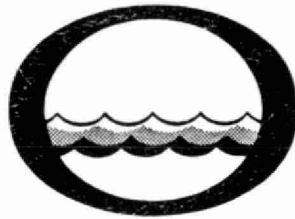
DUNNVILLE WATER SUPPLY SYSTEM

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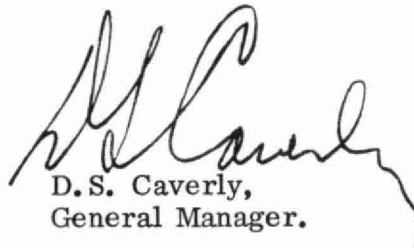


Water management in Ontario


Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operating during 1971 of the water supply system serving your community.

This operating summary contains parameters normally used to measure plant performance and to forecast demands for increased service, as well as relevant cost data. It is our objective to provide an adequate supply of safe and attractive water.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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DUNNVILLE
WATER TREATMENT PLANT

operated for

THE TOWN OF DUNNVILLE

THE ELECTRIC REDUCTION COMPANY LIMITED

SHERBROOKE METALLURGICAL COMPANY LIMITED

by the

ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

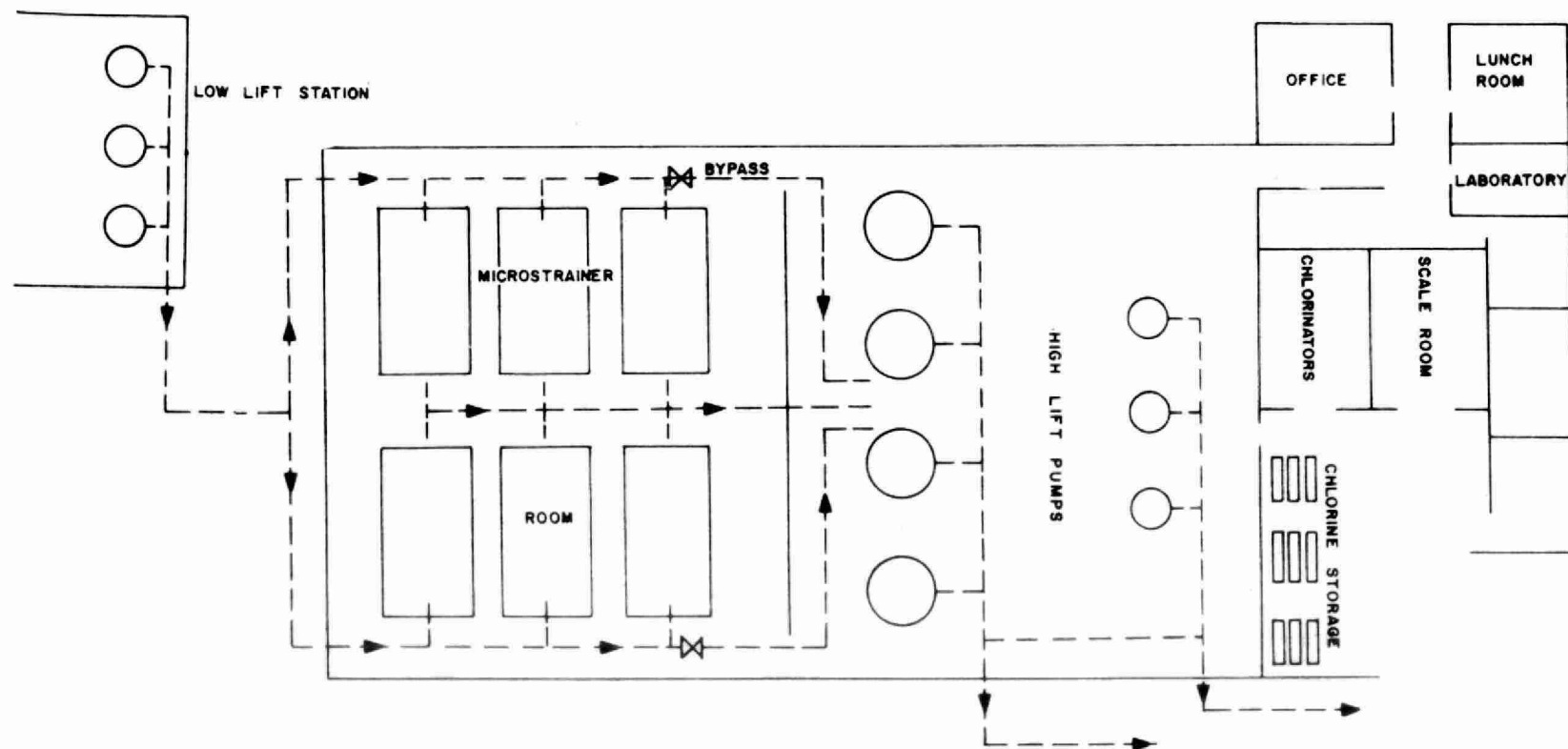


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DUNNVILLE REGIONAL WATER TREATMENT PLANT



DESIGN DATA

PROJECT NO.	6-0017-58	<u>INTAKE</u>	<u>CLEARWELL</u>
NOMINAL CAPACITY	20.5 mgd	<u>Depth of Intake</u> - 17 - 20 ft	Size: Two compartments, total capacity 200,000 gal.
RAW WATER SOURCE	Lake Erie	<u>Intake Pipe</u>	<u>CHLORINATION</u>
		Size: 1600 ft of 48" dia asbestos bonded corrugated metal	<u>Chlorinator</u>
		<u>LOW LIFT PUMPING STATION</u>	Type: W & T A-711
		<u>Screens</u>	Size: Two 2000 lb per day
		One removable screens 5' 6" sq with 3/8" openings one travelling water bar screen	Chlorine added at entrance to clear well
		<u>Low Lift Pumps</u>	<u>HIGH LIFT PUMPS</u>
		Type: Byron Jackson vertical turbine	<u>Supply to Dunnville</u> (via 23,000 ft of 16" dia asbestos cement pipe)
		Size: Four 5700 gpm @ 38 ft TDH	Type: Wheeler Economy single stage
		<u>MICROSTRAINER</u>	Size: One 1000 gpm @ 135' TDH
		Type: Glenfield & Kennedy with MK 1 fabrice (opening size 35 microns)	Two 1200 gpm at 230' TDH
		Size: Six 10' x 10'	<u>Supply to Port Maitland</u> (via 20,000 ft of 36" dia reinforced concrete pipe)
			Type: Worthington single stage
			Size: Four 4000 gpm @ 200' TDH

'71 Review

GENERAL

Installation of the travelling water screen was completed on April 7, 1971 and the screen was placed in operation. The travelling water screen efficiently removed algae throughout the remainder of the year.

A new transmitter, power pack and totalizer system was installed for the Port Maitland system.

Large boulders and stones were placed around the valve chamber at the east tunnel river crossing to protect the valve chamber from ice damage.

A buildup of frazil ice around the intake ports of the crib occurred on January 28 and 29, 1971 which resulted in a cut back of flow to the industrial participants. Frazil ice was noted on two other occasions during the winter months. However, it was not necessary to cut back flow to any of the participants.

PLANT FLOWS and CHLORINATION

A total of 2970.7 million gallons was treated during the year which represents a decrease of 16.7 percent from the previous year. The total flow to the Town of Dunnville was 434.2 million gallons, to Electric Reduction Company, 926.0 million gallons and to Sherbrooke Metallurgical Company, 1620.8 million gallons representing a 15.0 percent increase, a 21.6 percent decrease and a 19.4 percent decrease from 1970.

The average daily flow was 8.14 million gallons which is a decrease of 17.2 percent from 1970.

A total of 29068 pounds of chlorine were used during the year with an average dosage rate of 1.0 mg/l to obtain a 15 minute residual of 0.5 mg/l in the treated water.

WATER QUALITY

A total of 44 samples of raw water, 41 samples of treated water to the industrial system and 91 samples of treated water to the municipal system were analyzed for the presence of coliforms. The average coliform count in the raw water was 48 per 100 millilitres and was essentially zero for the treated water. Coliforms were noted on two separate occasions in samples from the industrial system. However, the presence of coliforms was attributed to faulty sampling techniques.

Algae Enumeration

Tests for the total algae count were carried out monthly on raw water samples. The average algae count was 750 ASU per ml. The two highest algae counts were noted in May and December when counts of 994 and 921 ASU per ml were recorded. The minimum algae count was noted early in March when 564 ASU per ml was recorded. The algae concentration in the raw water has shown a decreasing trend over the last three years.

TURBIDITY

The average turbidity for raw and treated water was approximately 9.7 Jackson turbidity units. At no time did the treated water turbidity meet the OWRC standards of 1.0 JTU.

CONCLUSIONS

The Dunnville Regional Supply System was operated satisfactorily during the year.

PROJECT COSTS

6-0017-58	
NET CAPITAL COST (Final)	\$546,880.86
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>-</u>
Long Term Debt to OWRC	<u>\$546,880.86</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	<u>\$160,329.03</u>
Net Operating	\$ 24,596.92
Debt Retirement	4,783.00
Reserve	2,060.76
Interest Charged	<u>30,669.75</u>
TOTAL	<u>\$ 62,110.43</u>

RESERVE ACCOUNT

Balance @ January 1, 1971	\$ 22,904.84
Deposited by Municipality	2,060.76
Interest Earned	<u>1,398.11</u>
	\$ 26,363.71
Less Expenditures	<u>3,916.74</u>
Balance @ December 31, 1971	<u>\$ 22,446.97</u>

PROJECT COSTS

ELECTRIC REDUCTION COMPANY NET CAPITAL COST (Final)	\$1,109,956.28
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>-</u>
Long Term Debt to OWRC	<u>\$1,109,956.28</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	\$ <u>330,926.58</u>
Net Operating	\$ 59,022.04
Debt Retirement	9,519.00
Reserve	3,840.30
Interest Charged	<u>62,247.05</u>
TOTAL	\$ <u>134,628.39</u>

RESERVE ACCOUNT

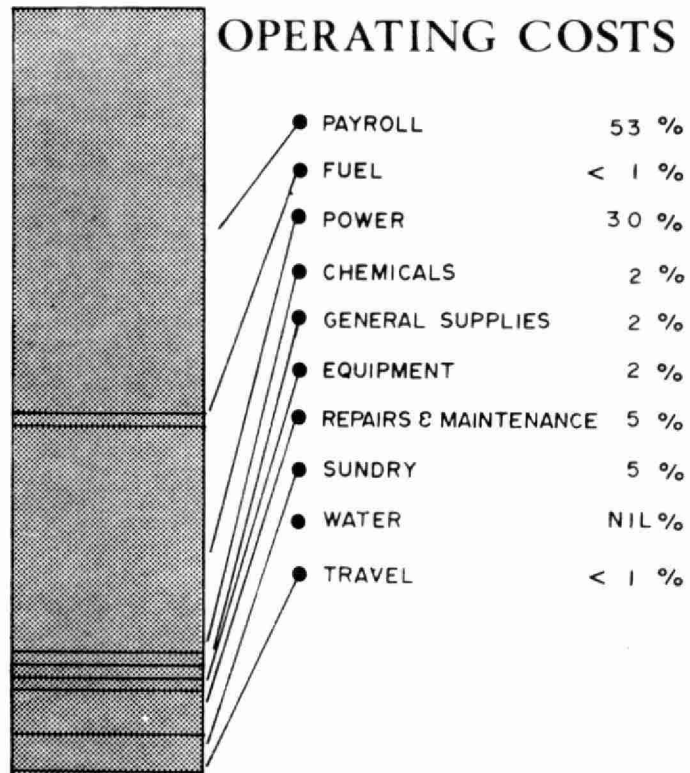
Balance @ January 1, 1971	\$ 52,270.82
Deposited by Municipality	3,840.30
Interest Earned	<u>3,354.86</u>
	\$ 59,465.98
Less Expenditures	<u>9,409.45</u>
Balance @ December 31, 1971	\$ <u>50,056.53</u>

PROJECT COSTS

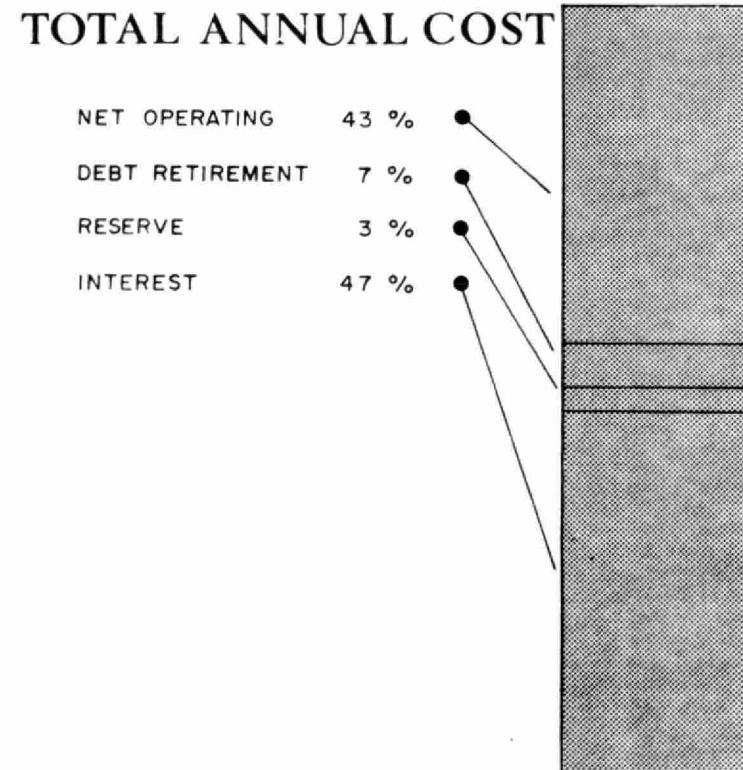
SHERBROOKE METALLURGICAL COMPANY NET CAPITAL COST (Final)	\$911,769.59
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>-</u>
Long Term Debt to OWRC	<u>\$911,769.49</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	<u>\$272,275.45</u>
Net Operating	\$ 48,480.51
Debt Retirement	7,781.00
Reserve	3,172.46
Interest Charged	<u>51,140.26</u>
TOTAL	<u>\$110,574.23</u>

RESERVE ACCOUNT

Balance @ January 1, 1971	\$ 42,408.62
Deposited by Municipality	3,172.46
Interest Earned	<u>2,755.68</u>
	\$ 48,336.76
Less Expenditures	<u>7,742.90</u>
Balance @ December 31, 1971	\$ <u>40,593.86</u>



1971 COSTS



Yearly Operating Costs

Year	Mil. Gal. Treated	Operating Cost	Operating Cost per 1,000 gallons	Total Cost	Total Cost per 1,000 gallons
1966	3802.109	\$ 98,983.63	2.60¢	\$308,574.01	8.12¢
1967	3714.052	105,380.00	2.84¢	314,660.32	8.47¢
1968	3422.067	104,861.63	3.06¢	312,713.65	9.14¢
1969	3353.020	114,767.34	3.42¢	321,797.81	9.60¢
1970	3568.800	122,942.34	3.44¢	329,687.42	9.24¢
1971	2970.7	132,099.47	4.45¢	307,213.05	10.34¢

COST TO EACH PARTICIPANT IN 1971

Participant	Mil. Gal. Used	Operating Cost	Operating Cost per 1,000 gallons	Total Cost	Total Cost per 1,000 gallons
Town of Dunnville	434.21	24,596.92	5.66	62,110.43	14.30¢
Electric Reduction	926.00	59,022.04	6.37	134,628.39	14.54¢
Sherbrooke Metallurgical	1620.81	49,480.51	2.99	110,574.23	6.82¢

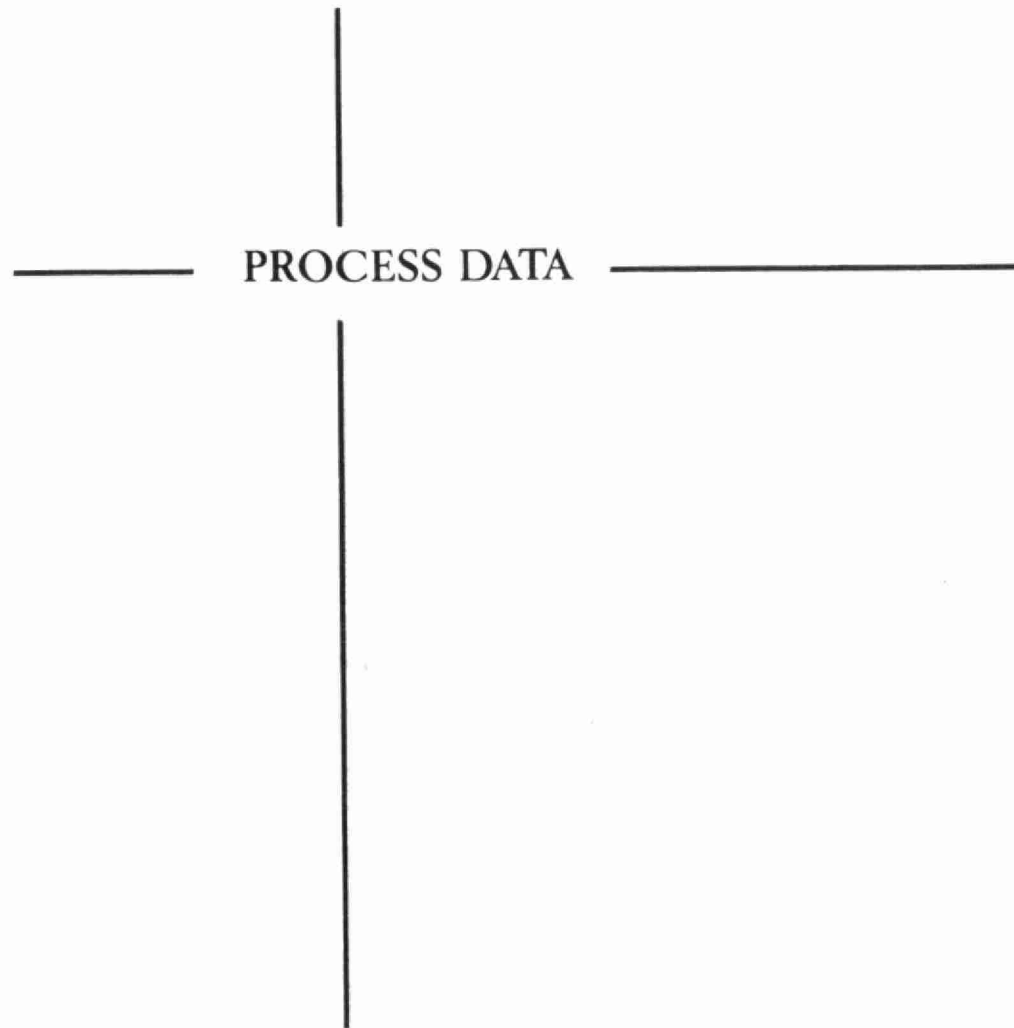
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY	TRAVEL
JAN	5447.05	4729.15	-	207.09	-	-	44.80	-	496.01	-	-
FEB	15734.47	7028.19	-	192.55	6881.24	1190.00	238.59	-	113.72	90.18	-
MAR	9005.39	4920.72	-	218.30	3063.40	-	218.21	-	69.22	440.84	74.70
APR	8823.30	4724.91	-	144.77	3334.72	-	391.67	-	222.93	4.30	-
MAY	9147.94	4849.16	487.14	117.12	3135.52	-	203.66	-	314.12	41.22	-
JUNE	12397.12	5173.15	(487.14)	23.01	3543.16	385.54	230.97	-	96.31	3291.63	140.49
JULY	10139.66	4774.98	-	19.86	3494.68	1260.00	360.89	-	42.31	186.94	-
AUG	8422.70	4850.42	-	8.51	3348.40	-	99.73	-	73.65	41.99	-
SEPT	11067.52	4657.50	-	-	2919.64	-	244.20	-	998.92	2178.56	68.70
OCT	12057.43	9724.85	-	25.17	-	70.54	209.40	1208.60	778.08	40.79	-
NOV	13623.86	6726.86	-	-	5993.60	-	118.53	-	762.29	32.58	-
DEC	16203.03	8259.29	-	133.46	3372.76	-	536.05	1074.83	2452.24	236.27	138.13
TOTAL	132099.47	70419.18	-	1089.84	39087.12	2906.08	2896.70	2283.43	6419.80	6585.30	422.02

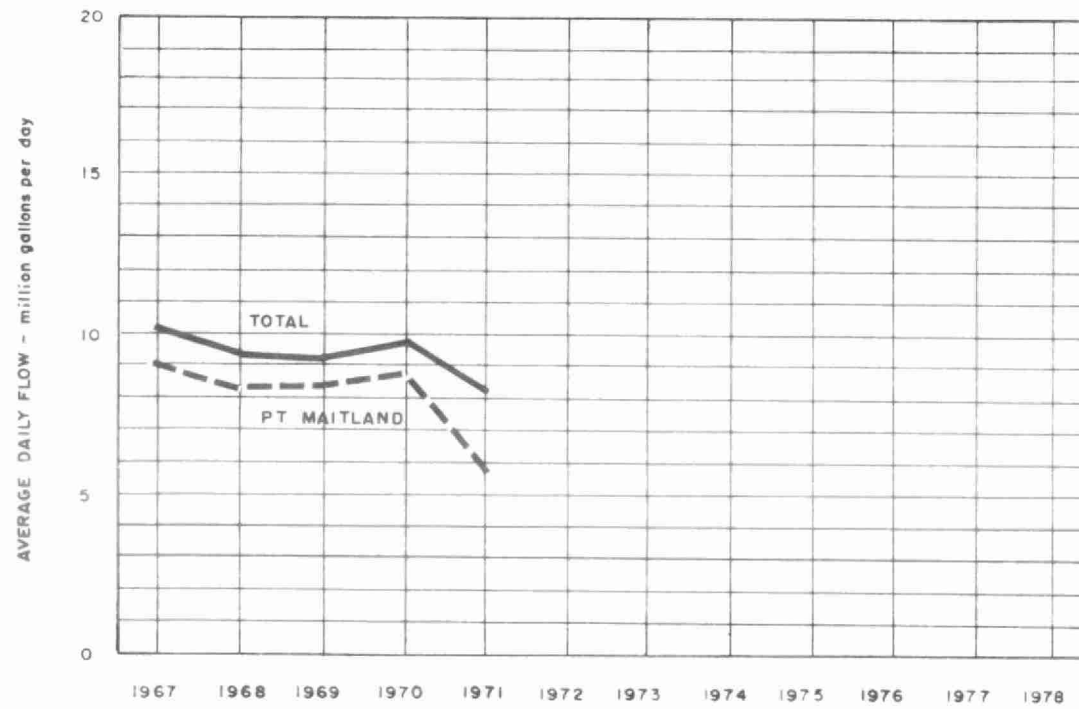
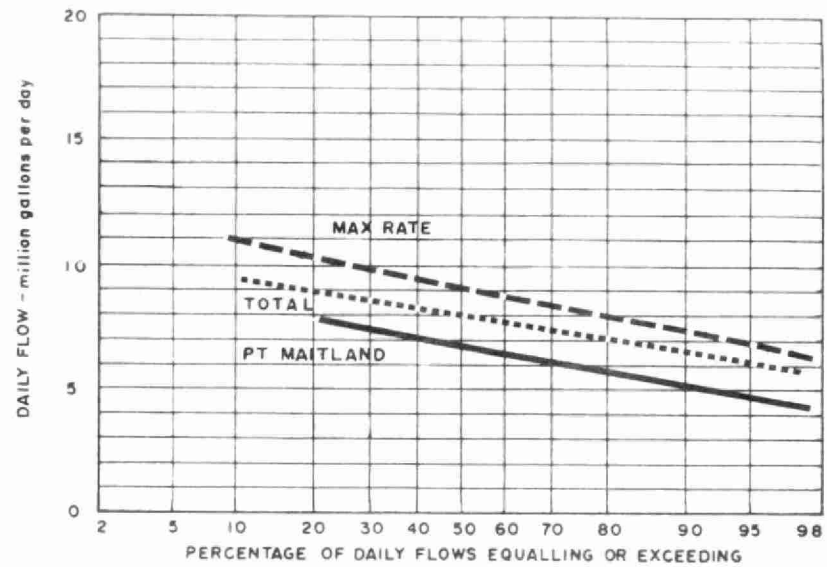
Brackets indicate credit.

MONTHLY FLOWS

MONTH	TOTAL FLOWS in millions of gallons			
	PORT MAITLAND	SHERBROOKE	ERCO	DUNNVILLE
JAN	219.81	155.01	87.45	32.28
FEB	169.88	135.60	57.76	29.29
MAR	219.18	167.24	62.80	31.85
APR	197.05	126.62	67.84	29.01
MAY	262.15	179.36	85.74	39.12
JUNE	235.96	154.23	75.97	39.83
JULY	222.71	144.63	71.55	48.58
AUG	192.03	102.83	79.44	50.73
SEPT	183.16	110.69	68.23	34.14
OCT	193.54	90.95	88.41	33.29
NOV	218.92	117.42	95.19	32.92
DEC	223.16	136.23	85.62	33.17
TOTAL	2537.55	1620.81	926.00	434.21
AVG	6.95	4.44	2.54	1.19



FLOWS



DESIGN CAPACITY 20.5

PLANT PERFORMANCE

MONTH	FLOWS				RAW WATER			TREATED WATER				
	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	MAXIMUM RATE mgd	TURBIDITY (AVERAGE) JTU	FILT INDEX	ALGAE ASU/ml	TURBIDITY		FILT INDEX	ALGAE ASU/ml	AVG TEMP ° F
								AVG JTU	MAX JTU			
JAN	252.1	8.13	10.13	-	13.9	.21	731	13.7	22.7	.08	-	32
FEB	199.2	7.11	9.60	-	3.6	.09	752	3.6	4.7	.05	-	32
MAR	251.0	8.10	9.78	-	6.1	.10	723	6.4	8.6	.05	-	32
APR	229.0	7.63	9.38	-	15.6	.10	797	15.6	22.5	.06	-	36
MAY	301.3	9.72	11.12	-	5.2	.09	994	5.2	9.9	.04	-	44
JUNE	275.8	9.19	10.13	-	4.3	.08	770	4.3	4.2	.02	-	55
JULY	271.3	8.75	9.71	-	5.6	.10	624	5.6	9.8	.02	103	67
AUG	242.8	7.83	9.27	-	4.5	.05	-	4.4	6.0	.02	-	68
SEPT	213.3	7.08	9.03	-	3.4	.09	-	3.3	4.6	.03	-	67
OCT	226.8	7.32	10.42	-	8.0	.23	487	7.7	14.2	.03	72	61
NOV	251.8	8.39	11.01	-	19.4	.35	618	14.0	23.2	.07	-	47
DEC	256.3	8.27	11.29	-	26.1	.33	878	25.9	40.6	.06	-	38
TOTAL	2970.7	-	-	-		-	-		-	-	-	-
AVG.	-	8.14	MAXIMUM 11.29	MAXIMUM -	9.7	.15	+ 725	25.9	MAXIMUM 40.6	.08	88+	MAXIMUM 68

+ Geometric Mean

CHLORINATION and DISINFECTION

MONTH	RAW WATER					INDUSTRIAL SYSTEM		MUNICIPAL SYSTEM		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF CHLORINE USED pounds	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
											PRE - mg/l	POST - mg/l	
	0	1 - 3	4 - 32	33 - 320	> 320								
JAN			1	1	2	4	0	8	0	2371	-	1.0	.5
FEB	1	1	1	1		4	0	8	0	1872	-	.9	.5
MAR		1	1	1	2	5	0	10	0	2566	-	1.0	.5
APR	1			3		3	0	9	0	2154	-	.9	.5
MAY	1		2			3	0	6	0	2830	-	.9	.5
JUNE	1	1			1	3	1	8	0	2611	-	.9	.5
JULY	1		1		2	4	0	7	0	2548	-	.9	.5
AUG	1	1	1		1	3	1	8	0	2248	-	.9	.5
SEPT			1	2		3	0	6	0	2242	-	1.2	.5
OCT			2		1	3	0	6	0	2300	-	1.0	.5
NOV	1		2	2		5	0	10	0	2582	-	1.0	.5
DEC				1	1	1	0	5	0	2744	-	1.1	.5
TOTAL	7	4	12	11	10	41	2	91	0	29068	-	-	-
AVG.	48 (NOTE - Average shown is the GEOMETRIC MEAN)					-	-	-	0	80 pounds per day	-	1.0	.5

WATER QUALITY

PROPERTY	RAW & TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as CaCO_3	17	145	188	128	80 - 100
ALKALINITY in mg/l as CaCO_3	17	104	132	90	30 - 100
IRON in mg/l Fe	17	.21	.35	.05	Less than 0.3
CHLORIDE in mg/l Cl^-	17	27	33	25	Less than 250
pH in pH units	17	8.2	8.3	7.9	7.0 - 8.5
FLUORIDE in mg/l F^-	11	0.1	0.2	0.1	Less than 1.2



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